

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Islam )  
Serial No.: To Be Assigned ) Group No.: Unknown  
Filed: Herewith ) Examiner: Unknown  
For: Broadband Sagnac Raman )  
Amplifiers and Cascade Lasers )

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Commissioner for Patents  
Washington, D.C. 20231

**PRELIMINARY AMENDMENT**

Before action on the merits, please consider the following amendments and remarks.

In the Related Applications:

**Please include the following:**

-- This application is a divisional of Serial No. 09/550,730, filed April 17, 2000, which is a divisional of Serial No. 09/110,696, filed July 7, 1998, which is a continuation-in-part of Serial No. 08/773,482, filed December 23, 1996, and claims the priority of Serial No. 60/080,317, filed April 1, 1998, all of which are incorporated herein by reference.--

In the Claims:

**Please cancel claims 1-109 without prejudice.**

**Please add the following new claims:**

1           110. A method of producing an amplified broadband optical signal, said  
2 method comprising:  
3           dividing an optical signal at a predetermined wavelength into a first beam  
4 having a wavelength less than the predetermined wavelength and a second beam  
5 having a wavelength greater than said predetermined wavelength;  
6           directing said first beam to a Raman amplifier;  
7           directing said second beam to a rare earth doped amplifier; and  
8           combining said first and second beams to produce an amplified broadband  
9 optical signal.

1 111. The method of producing an amplified broadband optical signal  
2 having a wavelength between 1530 to 1620 nm according to claim 110, wherein  
3 said rare earth doped amplifier is an erbium-doped fiber amplifier.

1 112. The method of claim 110, wherein the Raman amplifier amplifies and  
2 spectrally broadens the first beam and the rare earth doped amplifier amplifies and  
3 spectrally broadens the second beam.

1 113. The method of claim 110, wherein the optical signal has a wavelength  
2 between 1430 and 1620 nm.

1 114. A broadband amplifier, comprising:  
2 at least one input fiber;  
3 a splitter coupled to the input fiber, the splitter splitting an optical signal  
4 into at least a first wavelength and a second wavelength;  
5 one or more Raman amplifiers coupled to the splitter;  
6 one or more rare-earth doped optical amplifiers coupled to the splitter;  
7 a combiner coupled to the Raman amplifier and the rare-earth doped optical  
8 amplifier, the combiner combining an optical signal into at least a first wavelength  
9 and a second wavelength; and  
10 an output fiber coupled to the combiner.

1 115. The amplifier of claim 114, wherein the splitter directs the first  
2 wavelength to the Raman amplifier and the second wavelength to the rare-earth  
3 doped optical amplifier.

1 116. A broadband amplifier, comprising:  
2 at least one input fiber;  
3 a splitter coupled to the input fiber, the splitter splitting an optical signal  
4 into at least a first wavelength and a second wavelength;  
5 a first amplifier coupled to the splitter;  
6 a second amplifier coupled to the splitter, wherein a zero dispersion  
7 wavelength of the first amplifier is longer than a zero dispersion wavelength of the  
8 second amplifier;  
9 a combiner coupled to the first amplifier and the second amplifier, the  
10 combiner combining an optical signal into at least a first wavelength and a second  
11 wavelength; and

12 an output fiber coupled to the combiner.

1 117. A broadband amplifier, comprising:

2 at least one input fiber;

3 a splitter coupled to the input fiber, the splitter splitting an optical signal  
4 into at least a first wavelength and a second wavelength;

5 a first amplifier coupled to the splitter;

6 a second amplifier coupled to the splitter, wherein a pump wavelength of the  
7 first amplifier is larger than a pump wavelength of the second amplifier;

8 a combiner coupled to the first amplifier and the second amplifier, the  
9 combiner combining an optical signal into at least a first wavelength and a second  
10 wavelength; and

11 an output fiber coupled to the combiner.

1 118. A broadband amplifier, comprising:

2 at least one input fiber

3 a splitter coupled to the input fiber, the splitter splitting an optical signal  
4 into at least a first wavelength and a second wavelength;

5 a distributed gain medium coupled to the splitter, the distributed gain  
6 medium providing gain through a third order non-linearity;

7 one or more rare-earth doped optical amplifiers coupled to the splitter;

8 a combiner coupled to the distributed gain medium and the rare-earth  
9 doped optical amplifier, the combiner combining an optical signal into at least a  
10 first wavelength and a second wavelength; and

11 an output fiber coupled to the combiner.

1 119. The amplifier of claim 118, wherein the splitter directs the first

2 wavelength to the distributed gain medium and the second wavelength to the rare-


3 earth doped optical amplifier.

**REMARKS**

Attached please find a complete copy of applicant amendment of parent application in response to examiner action dated: February 1, 2001 which introduces claims 95-109 as examined on their merit. Applicant requests that these claims be considered as the precedent of this filing in response to examiner action dated: October 26, 2001 enclosed, allowing claims 39, 40, 95-109 and restricting claims 110-119 under 35 U.S.C. 121.

The Commissioner is authorized to charge any additional fees which may be required, including petition fees and extension of time fees, to Deposit Account No. 23-2415 (Docket No. 20434-758).

Respectfully submitted,  
WILSON SONSINI GOODRICH & ROSATI

  
Paul Davis, Reg. No. 29,294

Date:

2/19/01

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FOOT SHEET

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Islam )  
Serial No.: 09/550,730 ) Group No.: 2881  
Filed: 04/17/2000 ) Examiner: Monbleau, D.  
For: Broadband Sagnac Raman )  
Amplifiers and Cascade Lasers )

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Commissioner for Patents  
Washington, D.C. 20231

**SUPPLEMENTAL AMENDMENT**

This is a supplemental response to the office action mailed 2/1/2001.  
Please consider the following amendments and remarks:

**In the Claims:**

**Kindly add the following claims:**

1 110. (New) A method of producing an amplified broadband optical signal,  
2 said method comprising:  
3 dividing an optical signal at a predetermined wavelength into a first beam  
4 having a wavelength less than the predetermined wavelength and a second beam  
5 having a wavelength greater than said predetermined wavelength;  
6 directing said first beam to a Raman amplifier;  
7 directing said second beam to a rare earth doped amplifier; and  
8 combining said first and second beams to produce an amplified broadband  
9 optical signal.

1 111. (New) The method of producing an amplified broadband optical signal  
2 having a wavelength between 1530 to 1620 nm according to claim 110, wherein  
3 said rare earth doped amplifier is an erbium-doped fiber amplifier.

1 112. (New) The method of claim 110, wherein the Raman amplifier  
2 amplifies and spectrally broadens the first beam and the rare earth doped amplifier  
3 amplifies and spectrally broadens the second beam.

1 113. (New) The method of claim 110, wherein the optical signal has a  
2 wavelength between 1430 and 1620 nm.

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1 114. (New) A broadband amplifier, comprising:  
2 at least one input fiber;  
3 a splitter coupled to the input fiber, the splitter splitting an optical signal  
4 into at least a first wavelength and a second wavelength;  
5 one or more Raman amplifiers coupled to the splitter;  
6 one or more rare-earth doped optical amplifiers coupled to the splitter;  
7 a combiner coupled to the Raman amplifier and the rare-earth doped optical  
8 amplifier, the combiner combining an optical signal into at least a first wavelength  
9 and a second wavelength; and  
10 an output fiber coupled to the combiner.

1 115. (New) The amplifier of claim 114, wherein the splitter directs the first  
2 wavelength to the Raman amplifier and the second wavelength to the rare-earth  
3 doped optical amplifier.

1 116. (New) A broadband amplifier, comprising:  
2 at least one input fiber;  
3 a splitter coupled to the input fiber, the splitter splitting an optical signal  
4 into at least a first wavelength and a second wavelength;  
5 a first amplifier coupled to the splitter;  
6 a second amplifier coupled to the splitter, wherein a zero dispersion  
7 wavelength of the first amplifier is longer than a zero dispersion wavelength of the  
8 second amplifier;  
9 a combiner coupled to the first amplifier and the second amplifier, the  
10 combiner combining an optical signal into at least a first wavelength and a second  
11 wavelength; and  
12 an output fiber coupled to the combiner.

1 117. (New) A broadband amplifier, comprising:  
2 at least one input fiber;  
3 a splitter coupled to the input fiber, the splitter splitting an optical signal  
4 into at least a first wavelength and a second wavelength;  
5 a first amplifier coupled to the splitter;  
6 a second amplifier coupled to the splitter, wherein a pump wavelength of the  
7 first amplifier is larger than a pump wavelength of the second amplifier;

8 a combiner coupled to the first amplifier and the second amplifier, the  
9 combiner combining an optical signal into at least a first wavelength and a second  
10 wavelength; and  
11 an output fiber coupled to the combiner.

1 118. (New) A broadband amplifier, comprising:  
2 at least one input fiber  
3 a splitter coupled to the input fiber, the splitter splitting an optical signal  
4 into at least a first wavelength and a second wavelength;  
5 a distributed gain medium coupled to the splitter, the distributed gain  
6 medium providing gain through a third order non-linearity;  
7 one or more rare-earth doped optical amplifiers coupled to the splitter;  
8 a combiner coupled to the distributed gain medium and the rare-earth  
9 doped optical amplifier, the combiner combining an optical signal into at least a  
10 first wavelength and a second wavelength; and  
11 an output fiber coupled to the combiner.

1 119. (New). The amplifier of claim 118, wherein the splitter directs the first  
2 wavelength to the distributed gain medium and the second wavelength to the rare-  
3 earth doped optical amplifier.

**REMARKS**

Claims 39-40 and 95-109 are currently pending. Claims 110-119 are new. No claims have been canceled or amended.

The Commissioner is authorized to charge any additional fees which may be required, including petition fees and extension of time fees, to Deposit Account No. 23-2415 (Docket No. 20434-718).

Date: 6/22/01

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Respectfully submitted,  
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OCT 29 2001

WILSON, SONSINI,  
GOODRICH & ROSATI



UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office

Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09-11

02

071

65

PA

EXAMINER

ART UNIT

PAPER NUMBER

DATE MAILED:

DOCKETED

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

10033848-121901

### EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

#### *Election/Restrictions*

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 39, 40 and 95-109, drawn to a broadband pump assembly comprising a pump laser, classified in class 372, subclass 6.
- II. Claims 110-119, drawn to a broadband amplifier, classified in class 359, subclass 333.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because various types of amplifiers may

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Art Unit: 2881

be pumped by a pump laser. The subcombination has separate utility such as an amplifier in another optical system.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Newly submitted Claims 110-119 are directed to inventions that are independent or distinct from the invention originally claimed for the following reasons:

Claims 110-119 are drawn to a broadband amplifier while original Claims 39, 40 and 95-109 are drawn to a broadband pump assembly comprising a pump laser.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 110-119 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

This application is in condition for allowance except for the presence of claimed 110-119 to inventions non-elected without traverse. Accordingly, claims 110-119 have been cancelled.

#### ***Interview Summary***

An interview summary from the interview on 8/8/01, Paper No. 15, is included herein.

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TOTAL SHEETS

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Davienne Monbleau whose telephone number is 703-306-5803. The examiner can normally be reached on Mon-Fri 10:00 am to 6:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Davie can be reached on 703-308-4847. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

DNM  
October 19, 2001

James W. Davie  
Primary Examiner

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# Interview Summary

Application No.

09/550,730

Applicant(s)

ISLAM, MOHAMMED N.

Examiner

Davienne Monbleau

Art Unit

2881

All participants (applicant, applicant's representative, PTO personnel):

(1) Davienne Monbleau.

(3) Teresa Arroyo.

(2) Paul Davis.

(4) \_\_\_\_\_.

Date of Interview: 08 August 2001.

Type: a) ☒ Telephonic b) ☐ Video Conference

c) ☐ Personal [copy given to: 1) ☐ applicant 2) ☐ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☒ No.

If Yes, brief description: \_\_\_\_\_.

Claim(s) discussed: 110-119.

Identification of prior art discussed: none.

Agreement with respect to the claims f) ☒ was reached. g) ☐ was not reached. h) ☐ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: An amendment faxed on 6/22/01, including new claims 110-119, crossed in the mail with a notice of allowance mailed on 7/23/01. Applicant wants to have amendment entered. Examiner will receive case after it is printed and enter the amendment, which may be considered for restriction. If so, the Applicant will file a divisional for the new claims.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

i) ☒ It is not necessary for applicant to provide a separate record of the substance of the interview (if box is checked).

Unless the paragraph above has been checked, THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

Examiner's signature, if required

## Summary of Record of Interview Requirements

### Manual of Patent Examining Procedure (MPEP), Section 713.04, Substance of Interview Must be Made of Record

A complete written statement as to the substance of any face-to-face, video conference, or telephone interview with regard to an application must be made of record in the application whether or not an agreement with the examiner was reached at the interview.

#### Title 37 Code of Federal Regulations (CFR) § 1.133 Interviews

##### Paragraph (b)

In every instance where reconsideration is requested in view of an interview with an examiner, a complete written statement of the reasons presented at the interview as warranting favorable action must be filed by the applicant. An interview does not remove the necessity for reply to Office action as specified in §§ 1.111, 1.135. (35 U.S.C. 132)

#### 37 CFR §1.2 Business to be transacted in writing.

All business with the Patent or Trademark Office should be transacted in writing. The personal attendance of applicants or their attorneys or agents at the Patent and Trademark Office is unnecessary. The action of the Patent and Trademark Office will be based exclusively on the written record in the Office. No attention will be paid to any alleged oral promise, stipulation, or understanding in relation to which there is disagreement or doubt.

The action of the Patent and Trademark Office cannot be based exclusively on the written record in the Office if that record is itself incomplete through the failure to record the substance of interviews.

It is the responsibility of the applicant or the attorney or agent to make the substance of an interview of record in the application file, unless the examiner indicates he or she will do so. It is the examiner's responsibility to see that such a record is made and to correct material inaccuracies which bear directly on the question of patentability.

Examiners must complete an Interview Summary Form for each interview held where a matter of substance has been discussed during the interview by checking the appropriate boxes and filling in the blanks. Discussions regarding only procedural matters, directed solely to restriction requirements for which interview recordation is otherwise provided for in Section 812.01 of the Manual of Patent Examining Procedure, or pointing out typographical errors or unreadable script in Office actions or the like, are excluded from the interview recordation procedures below. Where the substance of an interview is completely recorded in an Examiner's Amendment, no separate Interview Summary Record is required.

The Interview Summary Form shall be given an appropriate Paper No., placed in the right hand portion of the file, and listed on the "Contents" section of the file wrapper. In a personal interview, a duplicate of the Form is given to the applicant (or attorney or agent) at the conclusion of the interview. In the case of a telephone or video-conference interview, the copy is mailed to the applicant's correspondence address either with or prior to the next official communication. If additional correspondence from the examiner is not likely before an allowance or if other circumstances dictate, the Form should be mailed promptly after the interview rather than with the next official communication.

The Form provides for recordation of the following information:

- Application Number (Series Code and Serial Number)
- Name of applicant
- Name of examiner
- Date of interview
- Type of interview (telephonic, video-conference, or personal)
- Name of participant(s) (applicant, attorney or agent, examiner, other PTO personnel, etc.)
- An indication whether or not an exhibit was shown or a demonstration conducted
- An identification of the specific prior art discussed
- An indication whether an agreement was reached and if so, a description of the general nature of the agreement (may be by attachment of a copy of amendments or claims agreed as being allowable). Note: Agreement as to allowability is tentative and does not restrict further action by the examiner to the contrary.
- The signature of the examiner who conducted the interview (if Form is not an attachment to a signed Office action)

It is desirable that the examiner orally remind the applicant of his or her obligation to record the substance of the interview of each case unless both applicant and examiner agree that the examiner will record same. Where the examiner agrees to record the substance of the interview, or when it is adequately recorded on the Form or in an attachment to the Form, the examiner should check the appropriate box at the bottom of the Form which informs the applicant that the submission of a separate record of the substance of the interview as a supplement to the Form is not required.

It should be noted, however, that the Interview Summary Form will not normally be considered a complete and proper recordation of the interview unless it includes, or is supplemented by the applicant or the examiner to include, all of the applicable items required below concerning the substance of the interview.

A complete and proper recordation of the substance of any interview should include at least the following applicable items.

- 1) A brief description of the nature of any exhibit shown or any demonstration conducted,
- 2) an identification of the claims discussed,
- 3) an identification of the specific prior art discussed,
- 4) an identification of the principal proposed amendments of a substantive nature discussed, unless these are already described on the Interview Summary Form completed by the Examiner,
- 5) a brief identification of the general thrust of the principal arguments presented to the examiner,  
(The identification of arguments need not be lengthy or elaborate. A verbatim or highly detailed description of the arguments is not required. The identification of the arguments is sufficient if the general nature or thrust of the principal arguments made to the examiner can be understood in the context of the application file. Of course, the applicant may desire to emphasize and fully describe those arguments which he or she feels were or might be persuasive to the examiner.)
- 6) a general indication of any other pertinent matters discussed, and
- 7) if appropriate, the general results or outcome of the interview unless already described in the Interview Summary Form completed by the examiner.

Examiners are expected to carefully review the applicant's record of the substance of an interview. If the record is not complete and accurate, the examiner will give the applicant an extendable one month time period to correct the record.

#### Examiner to Check for Accuracy

If the claims are allowable for other reasons of record, the examiner should send a letter setting forth the examiner's version of the statement attributed to him or her. If the record is complete and accurate, the examiner should place the indication, "Interview Record OK" on the paper recording the substance of the interview along with the date and the examiner's initials.